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CERAMIC HONEYCOMB FILTER AND ITS PRODUCTION
[セラミックハニカムフィルタ及びその製造方法]
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(54) [Title of the Invention] CERAMIC HONEYCOMB FILTER AND
ITS PRODUCTION

(57) Abstract

PROBLEM TO BE SOLVED: To obtain a ceramic honeycomb filter which decreases a pressure loss when an exhaust gas enters and exits and which can surely prevent leaking of the exhaust gas in a sealing body, and to obtain a production method of a ceramic honeycomb filter by which a ceramic honeycomb filter can be accurately produced with good precision using a small number of production processes.
SOLUTION: In this ceramic honeycomb filter, the sealing material 4 is alternately formed like a check pattern on both ends of the filter, and the cross-section area of the sealing body 4 on a through hole 3 is smaller than the area where no sealing body 4 is formed. The production of the ceramic honeycomb filter includes a process to produce through holes 3 where no sealing body 4 is formed to a specified depth and a larger cross section than the forming part of the sealing body 4, and a process to introduce the sealing material into the through holes 3.

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[Claims]

[Claim 1] A ceramic honeycomb filter characterized by a peripheral wall, said peripheral wall and the through tube wall is formed in said periphery wall in the shape of a honeycomb, two or more through tubes divided by said through tube wall, and the sealed object formed only in the end parts of said through tube, and while being a ceramic honeycomb filter and forming said sealed object in the shape of an abbreviation checker in the both-ends side of said ceramic honeycomb filter, the filter that is formed is smaller than the agenesis parts of said sealed object.

[Claim 2] A ceramic honeycomb filter according to Claim 1 with which the surface ratio of the cross parts of said formation parts to the cross parts of said agenesis parts of said sealed object of said through tube is characterized by being 20% - 50%.

[Claim 3] A manufacturing method of the ceramic honeycomb filter equipped with a ceramic honeycomb structure object which has a through tube of a large number formed in the shape of a straight line, and the sealed object formed in the end parts of each of said through tube is characterized by having a process which extends the cross parts of the agenesis parts of said sealed object of said through the tube in the predetermined depth rather than the formation

parts of said sealed object, and a process which introduces a sealing agent into said through tube.

[Claim 4] A manufacturing method of the ceramic honeycomb filter according to Claim 3 characterized by introducing said sealing agent into said through tube through said introductory hole while inserting said height in said through tube and extending the cross parts of said through tube using the extended installation fixture equipped with the height corresponding to said through tube which does not form said sealed object, and the introductory hole corresponding to said through tube which introduces said sealing agent.

[Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention relates to a ceramic honeycomb filter used for purification of the exhaust gas discharged from combustion engines, such as a Diesel engine, and its manufacturing method.

[0002]

[Prior Art] The ceramic honeycomb filter which consists of a ceramic of honeycomb structure for the purpose of removal of the floating fine particles in exhaust gas, such as

black smoke discharged by the diesel engines.

[0003] Figures 7 and 8 are used for the following explanation of a conventional honeycomb filter.

[0004] Figure 7 is the sectional view of the conventional ceramic honeycomb filter, and Figure 8 is the top view of the conventional ceramic honeycomb filter.

[0005] In Figures 7 and 8, 1 denotes an outer peripheral wall, 17, through hole gap wall, 18, a through tube, and 19 sealing material. As shown in Figure 7, a ceramic honeycomb filter has the through tube 18 of a large number divided by the peripheral wall 1 and a through tube wall 17 formed in one, and for each through tube 18, with only one edge by the sealed object 19. A minute hole (not shown) is formed in the through tube wall 17, and the sealed object 19 is formed in the shape of a checker, as shown in Figure 8.

[0006] In the ceramic honeycomb filter which has such a configuration, the through the hole (not shown) formed in the through tube wall 17 can flow, the exhaust gas which flowed from the through tube 18 wide open as the arrow head showed can flow out among other through tubes 18, and uptake of the floating fine particle in exhaust gas is carried out in this case. Then, exhaust gas flows out from the through tube 18 by which the end face of the opposite side is wide open at the time of an inflow.

[0007] As mentioned above, homogeneity and with a large number, the ceramic honeycomb filter has the advantage of through tube 18 straight-line-like so that the uptake area of the floating fine particle per unit volume is large. On the other hand, in order to carry out uptake of the floating fine particle in exhaust gas efficiently, the sealed object 19 must be completely joined to the through tube wall 17 so that exhaust gas may not leak in the part of the sealed object 19.

[0008] As the formation method of such a sealed object, the following methods indicated by JP57-7215A are known widely. First, after fabricating the ceramic honeycomb structure object which has many through tubes, the paper which infiltrated resin into the end face, or the film which consists of the quality of the material of an organic macromolecule is stuck, and the above-mentioned film with which the hole was made in the predetermined part of the film with the needle fixture, or the hole opened into the predetermined part is stuck on the end face of a ceramic honeycomb structure object. Next, from the hole of a film, it calcinates, after introducing a sealing agent into the edge of a through tube in the shape of a checker by press fit, vibration, or the dipping method.

[0009]

[Problems to be Solved by the Invention] However, since the above-mentioned conventional ceramic honeycomb filter had the almost fixed cross parts of a through tube from an inflow side to an outflow side, pressure loss arose by the sudden expansion size or sudden contraction of the cross parts to which the exhaust gas at the time of exhaust gas flowing into a through tube can circulate, and the cross parts, at the time of flowing out of a through tube, had the problem that the load to an engine increased.

[0010] Moreover, the manufacturing method of the above-mentioned conventional ceramic honeycomb filter needs the total open area, the EQC, or positive punching with a little of a through tube on (1) film for a predetermined part.

[0011] (2) When the hole which was able to be made in the film is extremely small, opening of a through tube cannot fully be closed, but exhaust gas leaks, and reduces collection efficiency remarkably.

[0012] (3) When the hole made in the film is larger than the open area of a through tube, a sealing agent is introduced into the opening of a through tube, which does not need the sealing and increases pressure loss.

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[0013] (4) The activity which makes a hole in a film with a needle fixture has thin thickness at porosity, and it is difficult to perform quickly punching with which a mechanical strength tended to damage a weak through tube wall and with which it was suitable for the opening area of a through tube. It had the problem that the workability and working efficiency in installation of a sealing agent were remarkably bad, and could not close a through hole certainly and correctly.

[0014] This invention solves the above-mentioned conventional technical problem, and the pressure loss at the time of the inflow of exhaust gas and an outflow is reduced. It aims to offer a ceramic honeycomb filter which can prevent exhaust gas leakage in a sealed object certainly. With the small number of routings, it is possible to introduce a sealing agent into the edge of a through tube often with precision and certainty. While being able to form the sealed object which can prevent an exhaust gas leak certainly, it aims to offer a manufacturing method for the ceramic honeycomb filter which can form the through tube which can reduce the pressure loss at the time of the inflow of exhaust gas, and outflow.

[0015]

[Means for Solving the Problem] In order to solve the above-mentioned technical problem the ceramic honeycomb filter of this invention characterized by a peripheral wall, said peripheral wall and the through tube wall is formed in said periphery wall in the shape of a honeycomb, two or more through tubes divided by said through tube wall, and the sealed object formed only in the end parts of said through tube, and while being a ceramic honeycomb filter and forming said sealed object in the shape of an abbreviation checker in the both-ends side of said ceramic honeycomb filter, the filter that is formed is smaller than the agenesis parts of said sealed object.

[0016] The ceramic honeycomb filter for which the pressure loss at the time of the inflow of exhaust gas and an outflow is reduced by this configuration, and can prevent the exhaust gas leak in a sealed object certainly can be offered.

[0017] Moreover, the manufacturing method of the ceramic honeycomb filter of this invention is the manufacturing method of the ceramic honeycomb filter equipped with the ceramic honeycomb structure object which has the through tube of a large number formed in the shape of a straight line, and the sealed object formed in the end parts of each

through tube, and consists of a configuration equipped with the process which extends the cross parts of the agenesis parts of the sealed object of a through tube in the predetermined depth rather than the formation parts of a sealed object, and the process which introduces a sealing agent into a through tube.

[0018] It is possible to introduce a sealing agent into the edge of a through tube often with precision and certainly with a small number of routings, and this configuration enables it to offer the manufacturing method of the ceramic honeycomb filter which can form the through tube which can reduce the pressure loss at the time of the inflow of exhaust gas, and an outflow, while being able to form the sealed object which can prevent an exhaust gas leak certainly.

[0019]

[Embodiment of the Invention]

[0020] In the invention according to Claim 2, there is an operation that has formation precision for a sealed object which improves while the surface ratio of the cross parts of the formation parts to the cross parts of the agenesis parts of the sealed object of a through tube is determined to be 20% - 50% and can reduce pressure loss more effectively.

[0021] Since the inclination for the formation precision of a sealed object to worsen is produced while it becomes impossible to reduce pressure loss effectively, when the inclination which a crack generates to a through tube wall is produced and it becomes large rather more than 50% a through tube wall will be extended, if surface ratio becomes smaller than 20%, neither is desirable.

[0022] The ceramic honeycomb structure object which has the through tube of a large number in the invention according to Claim 3 was formed in the shape of a straight line, the process which is the manufacturing method of the ceramic honeycomb filter equipped with the sealed object formed in the end parts of each through tube, and extends the cross parts of the agenesis parts of the sealed object of a through tube in the predetermined depth rather than the formation parts of a sealed object, while supposing that it had the process which introduces a sealing agent into a through tube and making the cross parts of the through tube of the sealed object formation parts smaller than the sealed object agenesis parts by introducing a sealing agent using the fixture which has an introductory hole corresponding to a through tube, with the small number of routings it is possible to introduce a sealing agent into the edge of a through tube often precisely and certainly.

While being able to form the sealed object which can prevent an exhaust gas leak certainly, since the cross parts of the through tube of the sealed object agenesis parts is large, it becomes possible to offer a manufacturing method of the ceramic honeycomb filter which can form the through tube which can reduce the pressure loss at the time of the inflow of exhaust gas and an outflow.

[0023] The invention according to Claim 4 is set to the invention according to Claim 3. While inserting in a through tube and extending the cross parts of a through tube using the extended installation fixture equipped with the height corresponding to the through tube which does not form a sealed object, and the introductory hole corresponding to the through tube which introduces a sealing agent, since it supposes that a sealing agent is introduced into a through tube through an introductory hole, and the cross parts of the through tube which does not form a sealed object with the same fixture is extended and a sealing agent can be introduced, while workability improves, it has an operation that the introductory precision of the sealing agent to a predetermined through tube improves.

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[0024] As an ingredient of the ceramic honeycomb filter in

the manufacturing method of the ceramic honeycomb filter of this invention, and a ceramic honeycomb filter, and a sealed object, ceramic ingredients, such as an alumina, a mullite, or cordierite, are used. Moreover, there may be added an organic binder, a plasticizer, ostomy material, etc. to these ceramic ingredients may be used.

[0025] Below, the example of an embodiment of this invention is explained.

(Embodiment 1) The section view of a ceramic honeycomb filter in Figure 1 is the embodiment of an operation and Figure 2 are the top views of the ceramic honeycomb filter in Embodiment 1 of this invention.

[0026] In Figures 1 and 2, as for a through tube wall and 3, 2 is a through tube and 4 sealed objects, and since a peripheral wall 1 is the same as that of the conventional example, it attaches the same symbols and omits explanation.

[0027] That the ceramic honeycomb filter in the embodiment of this operation differs from the conventional example to a peripheral wall and the sealed object 4 formed only in the end parts of two or more through tubes 3 divided by the through tube wall 2 formed in the shape of a honeycomb in the peripheral wall 1, while being formed in the shape of an abbreviation checker on the both-ends side of a ceramic honeycomb filter, it is that the cross parts A of the

formation parts of the sealed object 4 of a through tube 3 is formed smaller than the cross parts B of the agenesiis parts of a sealed object.

[0028] In the ceramic honeycomb filter which can set the embodiment of this operation which has the above-mentioned configuration, through the hole (not shown) formed in the through tube wall 2, it can flow, the exhaust gas which flowed from the through tube 3 wide opened as the arrow head showed can flow out among other through tubes 3, and uptake of the floating fine particle in exhaust gas is carried out in this case. Then, exhaust gas flows out from the through tube 3 by which the end face of the opposite side is wide open with the time of an inflow. Moreover, in a through tube 3, since the cross parts B of the agenesiis parts of the sealed object 4 is larger than the cross parts A of the formation parts of the sealed object 4, the pressure loss at the time of exhaust gas flowing in or flowing out is reduced, and since the cross parts A of the through tube 3 of the formation parts of the sealed object 4 is small, the sealed of the through tube 3 is certainly carried out with the sealed object 4, and the exhaust gas leak from the sealed object 4 is prevented.

[0029] According to the embodiment of this operation, it becomes possible to reduce the pressure loss at the time of

the inflow of exhaust gas, and an outflow, and to prevent the exhaust gas leak in a sealed object certainly as mentioned above.

[0030] The important parts section view of the ceramic honeycomb structure object production equipment which uses Figure 3 for the manufacturing method of the ceramic honeycomb filter by the embodiment of 1 operation of this invention, (Embodiment 2 of operation) the important parts section view of the through tube growth equipment which uses Figure 4 for the manufacturing method of the ceramic honeycomb filter by the embodiment of 1 operation of this invention, the top view of the extended installation fixture which uses Figure 5 for the manufacturing method of the ceramic honeycomb filter by the embodiment of operation 1 of this invention, and Figure 6 are the important parts section views of the sealing agent installation equipment used for the manufacturing method of the ceramic honeycomb filter by the embodiment of operation 1 of this invention.

[0031] In Figures 3-6, 5a and 5b are ceramic honeycomb structure object and 7 an extrusion briquetting machine, in 8, a honeycomb dice, and 9a and 9b are extended installation fixtures and 10 an introductory hole, 11 a conduction hole, 12, a table, 13, a post, 14, cylinder, 15, piston, and 16, sealing material, outer peripheral wall 1,

through hole gap wall 2, and through hole 3 have attached the same symbols therefore an explanation is omitted.

[0032] Next, the manufacturing method of the ceramic honeycomb filter in the embodiment of this operation is explained using Figures 3-6.

[0033] First, an extruding press machine 7 and the honeycomb dice 8 arranged in the outlet side of an extruding press machine, the extended installation fixture 9a which has the introductory hole 11 for introducing a sealing agent 16 into the height 10 and through tube 2 for enlarging the cross parts of a through tube 2 as shown in Figure 2 arranged on the table 12 of the rise and fall system arranged under the honeycomb dice 8, and the table 12, and a ceramic honeycomb structure object is produced like below using ceramic honeycomb structure object production equipment as shown in preparation 1.

[0034] After raising a table 12 and adjusting between a table 12 and the honeycomb dices 8 to a predetermined spacing, the constituents which were added and kneaded an organic binder, a plasticizer, ostomy material, etc. into ceramic ingredients, such as an alumina, a mullite, and cordierite, is fed into an extruding press machine 7, and an extruding press machine 7 is worked. Here, after adding dynamite glycerol 5 - 10 weight parts, and water 30 - 50

weight parts as a plasticizer with methyl cellulose 1 - 3 weight parts as an organic binder to the cordierite powder 100 weight parts as an example of a constituent, what was kneaded with kneading machines, such as a kneader, is mentioned.

[0035] In case the constituent extruded from an extruding press machine 7 passes the honeycomb dice 8, while it is fabricated in the shape of [which has the through tube 3 of a large number divided by the through tube wall 2 a honeycomb Ceramic honeycomb structure object 5a in which the cross parts of a through tube 3 was greatly formed in predetermined die length from the edge of a through tube 3 is manufactured by inserting only a predetermined die length in the through tube 3 in which the height 10 of extended installation fixture 9a arranged on the table 12 does not form a sealed object. Furthermore, a table 12 and an extruding press machine 7 are suspended to coincidence in the place which descended to the position while the table 12 synchronized with the knockout rate of ceramic honeycomb structure object 5a, and the cutting machine (not shown) which adjoined the extruding press machine 7 and was arranged cuts ceramic honeycomb structure object 5a by predetermined die length.

[0036] In addition, the method of cutting of ceramic

honeycomb structure object 5a moves a wire by a pneumatic cylinder etc. is used.

[0037] By the above actuation, ceramic honeycomb structure object 5a in which the cross parts was greatly formed only for the die length predetermined in the through tube 3 predetermined only in an end side is obtained from an edge.

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[0038] Next, after installing ceramic honeycomb structure object 5a on extended installation fixture 9a attached in the post 13 as shown in Figure 2 so that a height 10 may be inserted in the through tube 3 to which the cross parts was extended, extended installation fixture 9b is arranged in the upper part of ceramic honeycomb structure object 5a according to post 13. Like the extended installation fixture 9a, although extended installation fixture 9b has the height 10 for being inserted in the through tube 3 of ceramic honeycomb structure object 5a, and enlarging the cross parts of a through tube 3, and the introductory hole 11 for introducing a sealing agent 16 into a through tube 3 in case the extended installation fixture 9b is arranged in the upper part of ceramic honeycomb structure object 5a, it is made for the height 10 of extended installation fixture

9b to arrange in the introductory hole 2 of extended installation fixture 9a.

[0039] Thus, after arranging extended installation fixture 9b, the cross parts of a through tube 3 is greatly formed by the die length predetermined a top-face edge to only in the through tube 3 to which the cross parts was not extended by extended installation fixture 9a by carrying out the pressure welding of the extended installation fixture 9b to the top face of the ceramic honeycomb structure object 5a.

[0040] By the above actuation, a ceramic honeycomb structure object 5b in which the cross parts was greatly formed only for the die length predetermined in the predetermined through tube 3 of a both-ends side is obtained from an edge.

[0041] Next, after arranging a cylinder 14 through the post 13 on the extended installation fixture 9b of the through tube growth equipment shown in Figure 3 and being filled up with a sealing agent 16 in a cylinder 14, a sealing agent 16 is introduced from the introductory hole 11 by pressurizing a piston 15 using the sealing agent installation equipment as shown in Figure 4 which arranged the piston 15 on the sealing agent 16 in a cylinder 14. Furthermore, after reversing the ceramic honeycomb

structure object 5b in sealing agent installation equipment, a sealing agent 16 is similarly introduced into the edge of the opposite side of ceramic honeycomb structure object 5b through the introductory hole 11 of the extended installation fixture 9a.

[0042] Here, as a sealing agent 16, the same constituent as ceramic honeycomb structure object 5a is used. Moreover, the amount of the sealing agent 16 with which it is filled up in a cylinder 14, and the stroke of the pressurization of a piston 15 can perform control of the depth which introduces sealing agent 16.

[0043] Next, where the extended installation fixtures 9a and 9b of both ends are attached, after drying ceramic honeycomb structure object 5b primarily, the extended installation fixtures 9a and 9b are removed from ceramic honeycomb structure object 5b, and after introducing a sealing agent 16 into the variant through tube 3 into which the sealing agent in the periphery parts of the both-ends side of ceramic honeycomb structure object 5b is not introduced by the well-known method, it dries secondarily. Then, the ceramic honeycomb filter with which the cross parts of the formation parts of the sealed object 4 of a through tube 3 as shown in Figure 1 and 2 is formed smaller than the cross parts of the agensis parts of a sealed

object is obtained by calcinating at predetermined temperature.

[0044] While making the cross parts of the through tube of the sealed object formation parts smaller than the sealed object agenesis parts as mentioned above according to the embodiment of this operation by introducing a sealing agent using the fixture which has an introductory hole corresponding to a through tube, with the small number of routings, it is possible to introduce a sealing agent into the edge of a through tube often precisely and certainly. Since the cross parts of the through tube of the sealed object agenesis parts is large while being able to form the sealed object which can prevent an exhaust gas leak certainly, a ceramic honeycomb filter which can reduce the pressure loss at the time of the inflow of exhaust gas and an outflow can be manufactured.

[0045] Moreover, since the cross parts of the through tube which does not form a sealed object with the same fixture when an extended installation fixture has a height corresponding to the through tube which does not form a sealed object, inserts this height in a through tube and enlarges the cross parts of a through tube is enlarged and a sealing agent can be introduced, while workability improves, an introductory precision of the sealing agent to

a predetermined through tube improves.

[0046] An embodiment is used for further explanation of the invention.

[0047]

[Embodiments]

(Embodiment 1) By the same method as the embodiment of the 2nd operation, as it was the following, the ceramic honeycomb filter was produced.

[0048] First, the diameter of a peripheral wall attached in the outlet side of an extruding press machine the honeycomb dice for forming an abbreviated $\phi 160\text{mm}$ and the ceramic honeycomb structure object whose thickness is about 2.9mm and a through tube wall with the pitch of a through tube about 0.4mm , and used for extrusion molding of a ceramic honeycomb structure object, the ceramic honeycomb structure object production equipment as shown in Figure 3 which arranged the extended installation fixture on the table of the rise and fall system by the steel jack arranged in the location of about 100mm of lower parts of a honeycomb dice. In addition, the height which has the taper parts from which a point serves as 1.5mm angle, and the disc-like thing made from abbreviation $\phi 1\text{SUS303}$ which has a 1mm introductory hole were used for the extended installation fixture about 2mm from the tip by the prismatic form with a

height of about 8mm on 2.5mm square as shown in Figure 4.

[0049] Extrusion molding of the constituent which uses cordierite as a raw material was thrown in and carried out to the extruding press machine of this ceramic honeycomb structure object production equipment, and the ceramic honeycomb structure object in which the cross parts of the predetermined through tube of both ends was greatly formed by the same method as the embodiment of the 2nd operation was acquired using through tube growth equipment as further shown in Figure 4.

[0050] Next, it was introduced into the predetermined through tube which closes a sealing agent by press fitting through the introductory hole of an extended installation fixture. In addition, the methyl cellulose 1 weight parts, the dynamite glycerol 10 weight parts, and the water 60 weight parts were added to the sealing agent to the cordierite powder 100 weight parts, and the constituent kneaded with a kneading machine. Moreover, press fitting of a constituent was performed using sealing agent installation equipment as shown in Figure 6 by pressurizing a sealing agent, using about 10 kgf/cm² together with a piston.

[0051] Next, where an extended installation fixture is attached, after performing primary desiccation at the temperature of 50-60 °C and removing the extended installation fixture, the variant through tube of the periphery parts of a ceramic honeycomb structure object was closed by the dispenser.

[0052] Next, after drying secondarily at the temperature of 120-150 °C, it calcinated at about 1400 °C, and the ceramic honeycomb filter as shown in Figures 1 and 2 was obtained.

[0053] As a result of irradiating a beam of light at a level with the through tube of the ceramic honeycomb filter in this embodiment, there was no leak of light. Moreover, when introducing a sealing agent, it passed to the through tube used as the input of exhaust gas, or a tap hole, and adhesion, invasion, etc. of a sealing agent were not accepted.

[0054] Furthermore, in the ceramic honeycomb filter in this embodiment, it became clear that time until it results in 104Pa pressure loss was extended by about 20% compared with the conventional example.

[0055] (Embodiment 2) By the same method as the embodiment of the 2nd operation, as was the following, the ceramic honeycomb filter was produced.

[0056] First, the diameter of a peripheral wall attached in

the outlet side of an extruding press machine the honeycomb dice for forming abbreviation $\phi 160\text{mm}$ and the ceramic honeycomb structure object whose thickness of about 2.9mm and a through tube wall the pitch of a through tube is about 0.4mm , and used for extrusion molding of a ceramic honeycomb structure object at it ceramic honeycomb structure object production equipment as shown in Figure 3 which arranged the extended installation fixture on the table of the rise and fall system by the steel jack arranged in the location of about 100mm of lower parts of a honeycomb dice. In addition, diameter abbreviation $\phi 3.5\text{mm}$ of a base as shown in Figure 4, diameter abbreviation $\phi 1.5\text{mm}$ of a top face, the conic height with a height of 10mm , and the disc-like thing made from abbreviation ϕSUS303 which has a 1mm introductory hole were used for the extended installation fixture.

[0057] Extrusion molding of the constituent which makes cordierite a raw material was thrown in and carried out to the extruding press machine of this ceramic honeycomb structure object production equipment, and the ceramic honeycomb structure object in which the cross parts of the predetermined through tube of both ends was greatly formed by the same method as the embodiment of the 2nd operation was acquired using through tube growth equipment as further

shown in Figure 4.

[0058] Next, it introduced into the predetermined through tube which closes a sealing agent by press fit through the introductory hole of an extended installation fixture. In addition, the methyl cellulose 2 weight parts, the dynamite glycerol 8 weight parts, and the water 50 weight parts were added to the sealing agent to the cordierite powder 100 weight parts, and the constituent kneaded with the kneading machine was used. Moreover, press fit of a constituent was performed using sealing agent installation equipment as shown in Figure 6 by pressurizing a sealing agent by about 15 kgf/cm² with a piston.

[0059] Next, where an extended installation fixture is attached, after performing primary desiccation at the temperature of 50-60 degrees C and removing the extended installation fixture, the variant through tube of the periphery parts of a ceramic honeycomb structure object was closed by the dispenser.

[0060] Next, after drying secondarily at the temperature of 120-150 degrees C, it calcinated at about 1400 degrees C, and the ceramic honeycomb filter as shown in Figures 1 and 2 was obtained.

[0061] As a result of irradiating a beam of light, at a level with the through tube of the ceramic honeycomb filter

in this example, there was no leakage of light. Moreover, when introducing a sealing agent, it passed to the through tube used as the input of exhaust gas, or a tap hole, and adhesion, invasion, etc. of a sealing agent were not accepted.

[0062] Furthermore, in the ceramic honeycomb filter in this example, it became clear that time until it results in 104Pa pressure loss was extended about 20% compared with the conventional example.

[0063]

[Effect of the Invention] Since the cross parts of the sealed object agenesis parts into which it sets to a through tube, and exhaust gas flows or flows is larger than the sealed object formation parts as mentioned above according to the ceramic honeycomb filter of this invention, from the ability of the exhaust gas leak from a sealed object to be prevented the pressure loss at the time of the inflow of exhaust gas and an outflow is reduced, and since the cross parts of the through tube of the sealed object formation parts is small, the sealed of the through tube is certainly carried out with a sealed object, and while reduction of the load to an engine, and the improvement in fuel consumption and extension of uptake time amount are attained, the outstanding effectiveness that the ceramic

honeycomb filter is excellent in dependability and endurance without the exhaust gas leak in a sealed object is realizable.

[0064] Moreover, while making the cross parts of the through tube of the sealed object formation parts smaller than the sealed object agenesi s parts according to the manufacturing method of the ceramic honeycomb filter of this invention, by introducing a sealing agent using the fixture which has an introductory hole corresponding to a through tube, with the small number of routings, and since it becomes possible to introduce a sealing agent into the edge of a through tube often precisely and certainly, the outstanding effectiveness that the workability in installation of a sealing agent can be raised is acquired. Moreover, since the sealed object which can prevent an exhaust gas leak certainly can be formed, the outstanding effectiveness that a ceramic honeycomb filter with high endurance without the exhaust gas leak in a sealed object and dependability can be manufactured. Moreover, the cross parts of the through tube of the sealed object agenesi s parts is large, and since the through tube which can reduce the pressure loss at the time of the inflow of exhaust gas and an outflow can be formed, the outstanding effectiveness that the ceramic honeycomb filter in which reduction of the

load to an engine, and the improvement in fuel consumption and extension of uptake time amount are possible can be manufactured. Moreover, since the cross parts of the through tube which does not form a sealed object with the same fixture is enlarged and a sealing agent can be introduced, while workability improves, the outstanding effectiveness that an introductory precision of the sealing agent to a predetermined through tube improves is acquired.

[Brief Description of the Drawings]

[Figure 1] A section view of the ceramic honeycomb filter in Embodiment 1 of this invention

[Figure 2] The top view of the ceramic honeycomb filter in Embodiment 1 of this invention

[Figure 3] The important parts section view of the ceramic honeycomb structure object production equipment used for the manufacturing method of the ceramic honeycomb filter by the Embodiment 1 of this invention.

[Figure 4] The important parts view of the through tube growth equipment used for the manufacturing method of the ceramic honeycomb filter by Embodiment 1 of this invention

[Figure 5] The top view of the extended installation fixture used for the manufacturing method of the ceramic honeycomb filter by Embodiment 1 of this invention

[Figure 6] The important parts view of the sealing agent installation equipment used for the manufacturing method of the ceramic honeycomb filter by Embodiment 1 of this invention

[Figure 7] The parts view of the conventional ceramic honeycomb filter

[Figure 8] The top view of the conventional ceramic honeycomb filter

[Explanation of the Elements]

1 Peripheral Wall

2 17 Through tube wall

3 18 Through tube

4 19 Sealed object

5a, 5b Ceramic honeycomb structure object

7 Extrusion Briquetting Machine

8 Honeycomb Dice

9a, 9b Extended installation fixture

10 Height

11 Introductory Hole

12 Table

13 Post

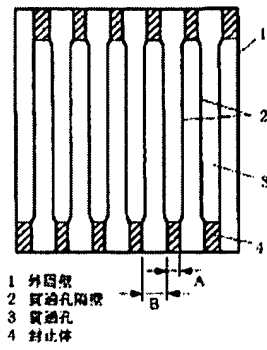
14 Cylinder

15 Piston

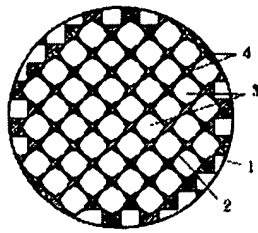
16 Sealing Agent

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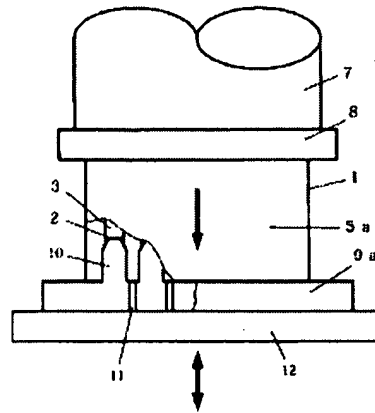
【图1】



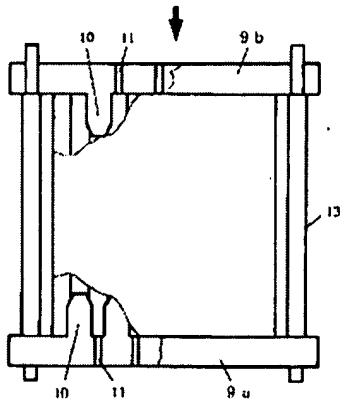
【图2】



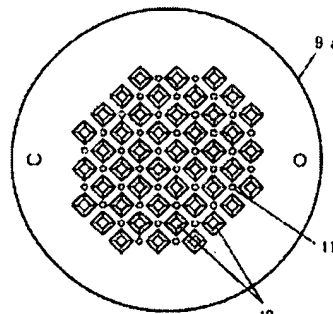
【图3】



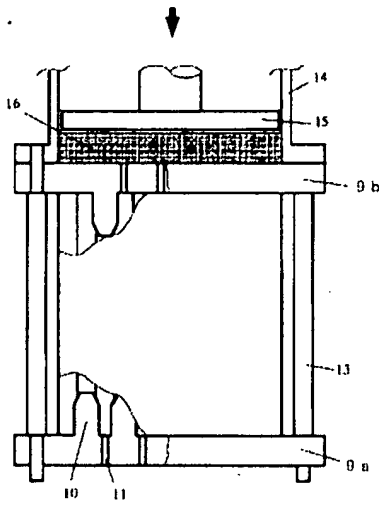
【图4】



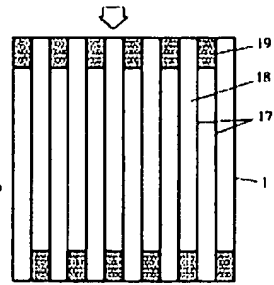
【图5】



【図6】



【図7】



【図8】

